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GRAIN INSPECTION, PACKERS AND STOCKYARDS
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FEDERAL GRAIN INSPECTION SERVICE
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AFLATOXIN HANDBOOK
CHAPTER 4
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CHAPTER 4

CERTIFICATION

<u>Section Number</u>	<u>Section</u>	<u>Page Number</u>
4.1	BACKGROUND	4-1
4.2	GENERAL PROCEDURES	4-1
4.3	STANDARD CERTIFICATION STATEMENTS ..	4-4
4.4	OPTIONAL STATEMENTS	4-5
4.5	REVIEW INSPECTION STATEMENTS	4-6

4.1 BACKGROUND

Testing performed on standardized grains (e.g., corn, wheat) is performed as an official criteria factor under the authority of the United States Grain Standards Act (USGSA), as amended. Testing performed on processed grain products (e.g., corn meal) and other commodities is provided under the authority of the Agricultural Marketing Act (AMA) of 1946, as amended.

Aflatoxin results are recorded on the pan ticket, worksheet, or loading log and in the remarks section of the certificate.

Certify aflatoxin test results on grain in accordance with the USGSA/AMA (as applicable) regulations.

Upon the request of the applicant, separate certificates may be issued for grade and for aflatoxin when both are determined on the same lot.

Sections 800.125 and 800.135 of the regulations under the USGSA permit a review inspection on either official grade/factors or official criteria. When requested, a review inspection for official grade or official factors and official criteria may be handled separately, even though both sets of results are reported on the same certificate. When official grade or official factors and official criteria are reported on the same certificate, the review inspection certificate shall show a statement indicating that the review results are for official grade, official factors, or official criteria, and that all other results are those of the original, reinspection, or appeal inspection results, whichever is applicable.

4.2 GENERAL PROCEDURES

The type of service requested and the test method used determine how aflatoxin results are recorded and certified.

a. Qualitative Testing.

- (1) Record the results of a **qualitative service** on the pan ticket and inspection log as being equal to or less than a threshold (e.g., 20 ppb) or as exceeding the threshold.
- (2) If a **quantitative method** is used to provide qualitative service, record the test results on the work records in a quantitative measurement (e.g., 10 ppb) or a qualitative measurement (e.g., ≤ 20 ppb).

(3) Certify results as being equal to or less than a threshold.

b. Quantitative Testing.

Record the results on the pan ticket and the inspection log to the nearest whole ppb.

When test results indicate that aflatoxin is present at a level of less than 5 ppb, certify the results as "Aflatoxin does not exceed 5 ppb."

Certify test results that are between the lower testing range (5 ppb) and the upper testing range (e.g., 80 ppb) to the nearest whole ppb.

Test results greater than the upper testing limit of the test kit are certified as exceeding the test kit range unless a supplemental analysis is performed. For example: An aflatoxin test result of 110 ppb obtained using an aflatoxin test kit with a test range of 5 - 80 ppb would result in the following certification statement: "Aflatoxin exceeds 80 ppb."

c. Certifying Test Results of Single and Combined Lots, Unit Trains, and Shiplots.

(1) Single Lot Inspection Basis for Trucks and Railcars.

Certify each test result on a separate certificate.

(2) Combined Land Carrier Basis for Trucks and Railcars.

If an applicant requests aflatoxin testing on a composite basis (up to 5 railcars and 15 trucks) and the inspection for grade on the basis of individual carriers, factor only certificates are issued for the aflatoxin testing and separate grade certificates are issued for each carrier.

(3) Composite Sample Testing for Shiplots.

Certify the composite results using the appropriate statement.

(4) Submitted Sample Testing.

Certify the results using the appropriate statement.

(5) Unit Train and Shiplot Inspection under the CuSum Loading Plan.

(a) Sublot Size for Shiplots.

The testing frequency for shiplot grain will be the same as the sample for grade analysis unless the applicant specifically requests aflatoxin analysis on the basis of a component sample.

(b) Sublot Size for Unit Trains.

The maximum size subplot for aflatoxin testing is 5 railcars for unit trains consisting of less than 200,000 bushels, or less than 50 cars. For unit trains consisting of 200,000 bushels or more, or 50 railcars or more, the maximum subplot size is 10 railcars.

For unit trains, the subplot size for aflatoxin testing and for grade analysis may be different. For example, an applicant may request grade analysis on the basis of a subplot containing two cars and request aflatoxin analysis on the basis of five cars.

(c) Recording Test Results.

Aflatoxin test results of subplot samples taken throughout loading are recorded on the loading log. A material portion occurs if the subplot result exceeds the limit as specified in the load order.

(d) Certifying Test Results.

Certify the lot based on the mathematical/weighted average (as applicable) of the accepted subplot results.

Certify material portions separately.

(e) Material Portions.

If a material portion occurs, the applicant has the option of requesting a review inspection. Review inspection results replace previous results when determining if a material portion exists.

If a material portion designation due to aflatoxin is not removed by the review inspection process, the applicant may leave the material portion on board and receive a separate certificate; return the grain to the elevator; or discharge the material portion along with additional grain in common stowage equivalent to one half the material portion quantity.

4.3 STANDARD CERTIFICATION STATEMENTS

Use one of the applicable statements for certifying aflatoxin.

a. Qualitative Testing.

When aflatoxin results are equal to or less than a specific threshold (e.g., 20 ppb) ppb:

"Aflatoxin equal to or less than 20 ppb."

"Aflatoxin exceeds 20 ppb."

b. Quantitative Testing.

(1) When aflatoxin results are less than 5 ppb, use the following statement.

"Aflatoxin does not exceed 5 ppb."

(2) When aflatoxin test results are between 5 ppb and the upper testing range (e.g., 80 ppb) of the test kit, round to the nearest whole number in ppb.

"Aflatoxin (result rounded to the nearest whole number) ppb."

(3) When aflatoxin test results exceed the upper testing range (e.g., 300 ppb) of the test kit.

"Aflatoxin exceeds (enter upper test limit) ppb."

c. HPLC Testing.

TSD performs HPLC testing for total aflatoxins, and, upon request of the applicant for service, testing can be performed to measure individual (i.e., B1, B2, G1, G2) aflatoxin isomers in a sample. The limits of quantification for individual aflatoxin measurements are 1 ppb for aflatoxins B1 or B2, and 2 ppb for aflatoxins G1 or G2.

Use the following statement to certify total aflatoxins.

"Aflatoxin (record actual results to the nearest whole number) ppb.
Results based on High Performance Liquid Chromatography Method."

To certify a specific aflatoxin in a sample use the following statement.

"Aflatoxin (insert B1, B2, G1, or G2 as applicable) (insert result to the nearest whole number) ppb. Results based on High Performance Liquid Chromatography Method."

To certify individual aflatoxins and the total aflatoxin concentration in a sample use the following statement.

"Aflatoxin (insert B1, B2, G1, or G2 as applicable) (insert result to the nearest whole number) ppb, total aflatoxins (record actual results to the nearest whole number) ppb. Results based on High Performance Liquid Chromatography Method."

4.4 OPTIONAL STATEMENTS

a. Aflatoxin Not Detected.

At the request of the applicant, use the following statement when aflatoxin is not detected (0 ppb).

"Aflatoxin not detected."

NOTE: If subplot results are combined and averaged and the lot average is equal to 0 ppb, but an individual subplot result exceeds 0.0 ppb, the statement may not be used.

b. Converting to Parts per Million (ppm).

At the request of the applicant, convert and certify the ppb result to parts per million (ppm) using an approved statement. To convert ppb to ppm, divide the ppb result by 1000.

"(Actual ppb result) ppb is equivalent to (converted ppm results) ppm."

c. Converting to Milligrams (mg) per Kilogram (kg), or Micrograms (µg) per Kilogram (kg).

At the request of the applicant, convert and certify results in milligrams per kilogram (mg/kg) or micrograms per kilogram (µg/kg). Use the following equivalents to determine mg/Kg or µg /kg:

$$\text{ppm} = \text{mg/kg}$$

$$\text{ppb} = \mu\text{g /kg}$$

"(Actual ppb result) ppb is equivalent to (converted mg/kg or µg /kg result)."

d. Multiple Results on the Same Certificate.

When certifying multiple aflatoxin results on the same certificate and the results are based on different sample types, the certificate must reflect the difference. As a guideline, the multiple results are shown as follows:

"Sublot sample results: Aflatoxin equal to or less than 20 ppb."

"Composite sample result: Aflatoxin 14 ppb."

e. Negative Result Statement.

At the request of the applicant, one of the following statements may precede the applicable standard statements when test results are equal to or less than 20 ppb.

"The aflatoxin result is negative." OR "Negative aflatoxin."

f. Type of Test Statement.

At the request of the applicant, use this statement to indicate the type of aflatoxin test used.

"Results based on (indicate type of test used) method."

NOTE: These certification statements may be modified as deemed necessary.

4.5 REVIEW INSPECTION STATEMENTS

Use the appropriate statements listed below for reinspection, appeal, and Board appeal inspections.

- a. Results are reported on the same kind of certificate issued for the original service and supersede the previously issued inspection certificate.

"This certificate supersedes Certificate No. (number) dated (date)."

- b. The superseded certificate is null and void as of the date of the subsequent (reinspection/appeal/Board appeal) certificate.

"The superseded certificate has not been surrendered."

- c. When a file sample is used, enter the following statement on the reinspection/appeal/Board appeal certificate:

"Results based on file sample."

- d. When reporting more than one official result on the same certificate but at different levels of inspection, explain this condition using one of the following applicable statements:

"(Grade, factor, or official criteria) results based on (new/file) sample. All other results are those of the original inspection service."

"(Grade, factor, or official criteria) results based on the appeal inspection. All other results are those of the (original inspection/reinspection) service."

"(Grade, factor, or official criteria) results based on the Board appeal inspection. All other results are those of the (original inspection/reinspection/appeal inspection) service."